IRN NO:	**ISS PAYLOAD OFFICE IRN/PIRN/EXCEPTION FORM**	**PAGE 1 OF 40**
		DATE PREPARED: **10/17/03 Revision A - 2/12/04 Revision B - 4/13/04 Revision C – 5/4/04**

Doc. No., Rev. & Title: **SSP 57000, Revision G** **Pressurized Payloads Interface Requirements Document**	PIRN NO: **57000-NA-0301C**

(P)IRN TITLE:

Payload Label Updates and Reductions

ORIGINATOR:	PIRN Type: *Check one*	*For Payload Office Use Only*
Name: **Rich Ellenberger/Rose Lindsey/Janet Kavandi** Agency: **NASA/Habitability & Human Factors** Phone: **281-483-5238**	☒ Standard PIRN ☐ Exception	☐ Exceedance ☐ Deviation ☐ Waiver
Utilization Change Engineer: Name: **Rich Ellenberger** Agency: **NASA IPLAT** Phone: **281-483-5238** FAX: **314-777-2866**	SSCN/CR	RELATED PIRN No.:
Agency Tracking No.: **57000-0225**	SYSTEM/ELEMENT AFFECTED & STAGE EFFECTIVITY:	

REASON FOR CHANGE: (INCLUDE APPLICABLE ICAP NUMBER)

This PIRN is a follow-up to the Lean 6 Sigma activity regarding Labels-OpNom. IPLAT, ODF, PODF, and Crew Office held a series of meetings to make all of the standards consistent. The result is this PIRN, which makes the label requirements consistent with SSP 50253 (ODF Standards) and SSP 50254 (OpNom standards). (Continued on page 2)

Rev A Changes: See page 2.
Rev B Changes: See page 3.
Rev C Changes: See page 4.

PARAGRAPHS, FIGURES, TABLES AFFECTED (For PIRN use only)

Page	Paragraph(s)	Figures(s)	Table(s)
	See page 2.		

AFFECTED INTERFACING PARTIES

	SIGNATURE & ORGANIZATION	DATE	SIGNATURE & ORGANIZATION	DATE	SIGNATURE & ORGANIZATION	DATE
CONCUR	OZ3		SSBRP		MELFI	
	Boeing PEI		EXPRESS Sustaining		Cryo	
	S&MA		SPD		JAXA CR/LSG	
	IPLAT (Originator)		FCF		ESA	
	Crew		MSAD		JAXA JEM EI	
	HRF		BTF			

REASON FOR CHANGE: (INCLUDE APPLICABLE ICAP NUMBER)

(Continued from page 1)

Some requirements were deleted. This PIRN will apply to newly designed payloads. Payloads that already have had an IPLAT initial label evaluation, or IPLAT or OpNom approval, will be grandfathered. Re-flight payloads are grandfathered also, unless there were comments made by the ISS flight crew (with Astronaut Office concurrence) about problems with labels that need to be fixed. The IPLAT process is not changing because the "musts" change to "shalls". There is still only one verification item (4.3.12.7), negotiable as in the past. IPLAT still has authority to approve a violation of a shall provided the situation is acceptable. No exception would be required.

PARAGRAPHS, FIGURES, TABLES AFFECTED (For PIRN use only)

Page	Paragraph(s)	Figures(s)	Table(s)	R	A	D
2-1	2.1				X	
2-4	2.2				X	X
3-7	3.1.1.3.C			X		
3-16	3.1.1.6.2			X		
3-75	3.3.5.2.3.B			X		
3-80	3.3.7.3.1			X		
3-80	3.3.7.3.2			X		
3-134			3.12.3.4-1	X		
A-1 to A-8	Appendix A				X	X
C-1 to C-35	Appendix C (entire)			X		

Summary Of Rev A Changes In This PIRN

Note: Sections and tables/figures were renumbered by OZ3 direction.

1) All SSP 57000 references regarding the rack utility interface panel are changed to "Rack UIP" for consistency. Added C.3.4.3.B.3 to require the Rack UIP to be called "Rack UIP". Changed Figure C.3.4.3-1 to make the rack example more realistic, having a Rack UIP, and added the label.

2) The "must" requirements change to "shalls". But IPLAT's process is not changing. There is still only one verification requirement, 4.3.12.7, fulfilled by a signed JSC Form 732. Multiple verification paperwork for each shall is not needed. IPLAT has always treated the "must" requirements as "shalls", so only the semantics are changing. The use of the word "shall" is meant to convey the importance of those requirements.

3) Updated C.2 based on the new integrated OpNom IPLAT process. Updated Figure C.1-1 to add block regarding preliminary OpNom. Updated notes to remove date references.

4) Defined "passive", "active", "Non-rack self-contained payloads", and "Loose Equipment".

5) There is a new combination Hardware ID label that will take effect for payloads with the approval of this PIRN. See Figure C.3.4.1.D-1. Requirements for this label were added. This label will be a

standard label that can be ordered from the DDPF (Decal Design & Production Facility) via drawing SDG32108325. Table C.3.4.1.F-1 was moved from section C.3.5.10 and updated to show all categories of hardware and their associated sizes for labels, to remove ambiguity.

6) Clarified in C.3.4.4.1 that all items "that have a crew interface" shall be labeled.

7) C.3.4.4.2.1 Cable/Hose Labeling section:
   - States that permanent cables (fixed at one end) do not need IMS barcodes, but the loose end still needs an end label describing the interface.
   - Clarified that permanent cables only need ID labels if they must be distinguished from other cables on the same device.
   - Clarified that multiple ID labels every 2 meters are only needed when a cable/hose is 6 meters of greater in length.
   - Added that "M/W" is being accepted for already-designed Boeing provided ISS cables as long as connection information is obvious.
   - Allows for cases where only the "P" number on a cable end label is required, not only for generic cable circumstances, but also for when flag style labels displaying all three lines of interface information would create physical interference and visual clutter, which would actually create a negative human factors situation for the crew.
   - Updated Figure C.3.4.4.2-1.1 for the new Hardware ID label.

8) Deleted Figure C.3.5.6-1 Operating Instruction Label example, and state that such labels (that contain procedure steps) must be approved by ODF component board – U.S. PODFCB for U.S. payloads.

9) Deleted Figure C.3.5.7 Stowage Container Label example, and added stowage kit contents label to Figure C.3.4.1.D-1 Hardware ID Label.

10) C.3.4.8: Noted that non-standard Caution and Warning label wording must be approved by the Payload Safety Review Panel (PSRP), or an OZ3 safety representative.

11) Dramatically reduced the Alphanumeric section, now C.3.4.9, to delete requirements IPLAT never verified, nor had a need to verify because professional labeling created by modern computers and printers have all the stroke width to height ratios, for example, built in to their systems.

12) Simplified the Scale Marking section, now C.3.6.

Revision B Changes:

13) Updated Reason for change language, grandfathering re-flight payloads unless there were label problems on ISS.

14) Remove all reference to "font size", just use measurements like inches and millimeters.

15) C.3.4.4.2.2 Color Coding: Add a statement that says labels not falling into the allowed marking/background combinations will be approved on a case by case basis, the key is contrast.

16) C.3.4.3D.3: Added a statement that if there's only room for the OpNom or a barcode, but not both, that OpNom takes precedence.

17) Rev A mistakenly changed “ISPR connector interface panel” references to “Rack UIP”, when the original intention of this term was to denote the module level UIP at the standoff location. Thus, changed all references for “ISPR connector interface panel” to “Module UIP”.

18) Made sure references to the “Rack UIP” have the “R” capitalized.

19) Fixed reference for access panel label requirements in Figure C.3.4.3-1. It was C.3.5.4.2.3.B, it’s now C.3.4.4.2.3.B.

20) Changed “Module UIP” to just “UIP”.

21) Changed C.3.4.4.2.1.B.1.b to avoid long or complicated “J” numbers for electrical ports.

22) Added a “should” requirement to minimize the “white space” around label text on decals. This is to reduce the footprint of labels without decreasing font size. Unnecessary white space can create physical clutter and can interfere with operations.

23) Add requirement for location coding of compartments with ORUs to aid the crew with install or replacement activities.

24) Fixed the cable label figure to show the new format for the combination Hardware ID label for cables and hoses, which differs slightly from the regular labels by having the barcode on the bottom to save horizontal space (parallel to the cable), and move the flow direction arrow to the bottom similar to an existing IMS hose label with flow direction.

25) Added two documents to the Section 2.1 Applicable Documents list and three documents to Section 2.2 Reference Documents list.

Revision C Changes:

26) Removed section C.3.4.4.2.3.D. (A future PIRN will add this section back in once a clear definition and understanding of “compartments” has been established.)

2.1 APPLICABLE DOCUMENTS

DOCUMENT NO	TITLE

Add:

SSP 50007	Space Station Inventory Management System Bar Code Label Requirements and Specification
SSP 50254	Operations Nomenclature

2.2 REFERENCE DOCUMENTS

Add:

JSC Form 732	ISS Payload Label Final Disposition Form
MIL-STD-130	Identification Marking Of U.S. Military Property
NSTS 07700	Space Shuttle Program Definition and Requirements

Delete:

SSP 50007	Space Station Inventory Management System Label Specification

From:

3.1.1.3 LOADS REQUIREMENTS

C. Rack Utility Panel (RUP) umbilicals shall be restrained during launch and landing to prevent damage to loose connectors from loads and vibration.

To:

3.1.1.3 LOADS REQUIREMENTS

C. Rack UIP umbilicals shall be restrained during launch and landing to prevent damage to loose connectors from loads and vibration.

From:

3.1.1.6.2 UMBILICAL PHYSICAL MATE

Integrated racks shall provide a Rack Utility Panel and umbilicals that allow connection of rack utilities from the rack to the standoff Utility Interface Panel defined in SSP 41002, Figure 3.2.2-1 and the appropriate Utility Interface Panel connector layout defined in SSP 41002, Figures 3.3-1 through 3.3-5.

To:

3.1.1.6.2 UMBILICAL PHYSICAL MATE

Integrated racks shall provide a Rack UIP and umbilicals that allow connection of rack utilities from the rack to the UIP defined in SSP 41002, Figure 3.2.2-1 and the appropriate Utility Interface Panel connector layout defined in SSP 41002, Figures 3.3-1 through 3.3-5.

From:

3.3.5.2.3 LRDL CABLING

B. The integrated rack MIL-STD-1553B internal wiring stub length shall not exceed 12 feet, (3.65 meters), when measured from the internal MIL-STD-1553B Remote Terminal to the ISPR Utility Interface Panel.

To:

3.3.5.2.3 LRDL CABLING

B. The integrated rack MIL-STD-1553B internal wiring stub length shall not exceed 12 feet, (3.65 meters), when measured from the internal MIL-STD-1553B Remote Terminal to the UIP.

From:

3.3.7.3.1 INTEGRATED RACK HRDL TRANSMITTED OPTICAL POWER

The integrated rack that transmits data on the HRDL, with or without an ARIS adapter, shall be designed to transmit a HRDL signal in accordance with section 3.1.1, Transmitter Optical Characteristics of SSP 50184 at an average optical power greater than –16.75 dBm and less than –8.3 dBm. The integrated rack transmitted optical power will be measured at the integrated rack P7

connector to the ISPR connector interface panel using the Halt symbol in accordance with Table 3.1-3, 4B/5B NRZI Encoding in SSP 50184.

To:

3.3.7.3.1 INTEGRATED RACK HRDL TRANSMITTED OPTICAL POWER

The integrated rack that transmits data on the HRDL, with or without an ARIS adapter, shall be designed to transmit a HRDL signal in accordance with section 3.1.1, Transmitter Optical Characteristics of SSP 50184 at an average optical power greater than –16.75 dBm and less than –8.3 dBm. The integrated rack transmitted optical power will be measured at the integrated rack P7 connector to the UIP using the Halt symbol in accordance with Table 3.1-3, 4B/5B NRZI Encoding in SSP 50184.

From:

3.3.7.3.2 INTEGRATED RACK HRDL RECEIVED OPTICAL POWER

The integrated rack that receives data on the HRDL, with or without an ARIS adapter, shall be designed to receive a HRDL signal in accordance with section 3.1.2, Receiver Optical Characteristics of SSP 50184 at an average optical power less than or equal to –30.45 dBm. The integrated rack received optical power will be measured at the integrated rack P7 connector to the ISPR connector interface panel using the Halt symbol in accordance with Table 3.1-3, 4B/5B NRZI Encoding in SSP 50184.

To:

3.3.7.3.2 INTEGRATED RACK HRDL RECEIVED OPTICAL POWER

The integrated rack that receives data on the HRDL, with or without an ARIS adapter, shall be designed to receive a HRDL signal in accordance with section 3.1.2, Receiver Optical Characteristics of SSP 50184 at an average optical power less than or equal to –30.45 dBm. The integrated rack received optical power will be measured at the integrated rack P7 connector to the UIP using the Halt symbol in accordance with Table 3.1-3, 4B/5B NRZI Encoding in SSP 50184.

From:

TABLE 3.12.3.4-1 SURFACE INTERIOR COLORS AND PAINTS

HARDWARE DESCRIPTION	COLOR	FINISH	PAINT SPECIFICATION PER FED–STD–595
Equipment Rack Utility Panel Recess	White	Semigloss	27925
Equipment Rack Utility Panel Text Characters	Black	Lusterless	37038
ISPR Utility Panel Recess	White	Semigloss	27925
ISPR Utility Panel Recess Text Characters	Black	Lusterless	37038
Functional Unit Utility Panel Recess (as applicable)	White	Semigloss	27925
Functional Unit Utility Panel Recess Text Characters	Black	Lusterless	37038
Rack Front Aisle Extensions	Off-White	Semigloss	27722
Overhead Rack Face Plates	Off-White	Semigloss	27722
Port Rack Face Plates	Off-White	Semigloss	27722
Starboard Rack Face Plates	Off-White	Semigloss	27722
Deck Rack Face Plates	Off-White	Semigloss	27722
Overhead Rack Utility Panel Closeouts	Off-White	Semigloss	27722
Port Rack Utility Panel Closeouts	Off-White	Semigloss	27722
Starboard Rack Utility Panel Closeouts	Off-White	Semigloss	27722
Deck Rack Utility Panel Closeouts	Off-White	Semigloss	27722
Stowage Trays	Off-White	Semigloss	27722
Stowage Tray Handle Straps (any location)	Natural/Off White Material	Semigloss	none
Common Seat Track	Nickel Plate	Semigloss	None
Glovebox (Aluminum or Plastic)	Medium Gray	Gloss	16329 or 16373
Glovebox (Aluminum)	White	Gloss	17925
Glovebox (Aluminum or Plastic)	Off-White	Gloss	17722
Glovebox (Aluminum)	Tan	Gloss	10475
EXPRESS Program Rack Utility Panels	Off-White	Gloss	17875

To:

TABLE 3.12.3.4-1 SURFACE INTERIOR COLORS AND PAINTS

HARDWARE DESCRIPTION	COLOR	FINISH	PAINT SPECIFICATION PER FED–STD–595
Equipment Rack UIP Recess	White	Semigloss	27925
Equipment Rack UIP Text Characters	Black	Lusterless	37038
UIP Recess	White	Semigloss	27925
UIP Recess Text Characters	Black	Lusterless	37038
Functional Unit Utility Panel Recess (as applicable)	White	Semigloss	27925
Functional Unit Utility Panel Recess Text Characters	Black	Lusterless	37038
Rack Front Aisle Extensions	Off-White	Semigloss	27722
Overhead Rack Face Plates	Off-White	Semigloss	27722
Port Rack Face Plates	Off-White	Semigloss	27722
Starboard Rack Face Plates	Off-White	Semigloss	27722
Deck Rack Face Plates	Off-White	Semigloss	27722
Overhead Rack UIP Closeouts	Off-White	Semigloss	27722
Port Rack UIP Closeouts	Off-White	Semigloss	27722
Starboard Rack UIP Closeouts	Off-White	Semigloss	27722
Deck Rack UIP Closeouts	Off-White	Semigloss	27722
Stowage Trays	Off-White	Semigloss	27722
Stowage Tray Handle Straps (any location)	Natural/Off White Material	Semigloss	none
Common Seat Track	Nickel Plate	Semigloss	None
Glovebox (Aluminum or Plastic)	Medium Gray	Gloss	16329 or 16373
Glovebox (Aluminum)	White	Gloss	17925
Glovebox (Aluminum or Plastic)	Off-White	Gloss	17722
Glovebox (Aluminum)	Tan	Gloss	10475
EXPRESS Rack Control Panels	Off-White	Gloss	17875

APPENDIX A ABBREVIATIONS AND ACRONYMS

Add:

DDPF	Decal Design & Production Facility
GFE	Government Furnished Equipment
IMS	Inventory Management System
IP	International Partner
IPLAT	ISS Payload Label Approval Team
LCD	Liquid Crystal Display
LED	Light Emitting Diode
ODF	Operations Data File
OpNom	Operations Nomenclature
PD	Payload Developer
PDL	Payload Data Library
SI	Standard International
UIP	Utility Interface Panel
USPODFCB	United States Payload Operations Data File Control Board

Delete:

RUP	Rack Utility Panels

From:

SSP 57000 Rev G Appendix C

To: (following pages)

APPENDIX C INSTRUCTIONS FOR LABELS AND DECALS

TABLE OF CONTENTS

TABLES

FIGURES

C.1 INTRODUCTION

The ISS Payload Label Approval Team (IPLAT) reviews and approves labels for ***all payload equipment that the crew will interface with during nominal operations, planned maintenance, and contingency operations***. IPLAT reviews labels against the instructions contained herein.

– Labels reviewed by IPLAT **include**, but are not limited to:

- •Rack/subrack front panel type hardware
- •All experiment equipment, loose or mounted other than in rack/subrack formation
- •Cables, fluid lines, hoses, etc., with which the crewmember interfaces
- •All internal and external ORUs and the cables and hoses that connect to them
- •All equipment controls, switches, ports, LEDs, stowage containers, etc.
- •Interfaces to the ISS Utility Interface Panel (UIP), including cable and hose ports

– Items IPLAT does not review:

- •Items which the crew will not interface with (e.g. internal circuit boards, etc.)
- •Labels contained within software displays, procedures, cue cards. These are handled by the U.S. Payload Operations Data File Control Board (USPODFCB) or appropriate Operations Data File (ODF) control board.

Appendix C provides instructions for the approval of payload labels. The development of labels is a joint process requiring the cooperative efforts of IPLAT and the payload developer (PD). The process for developing labels begins with the PD providing pre-released engineering drawings, and ends with the delivery of flight certified labels. The label approval process flow diagram is shown in Figure C.1–1.

To understand the priorities of the instructions, the following definitions need to be applied throughout Appendix C.

Statements with “shall” will be used for instructions that are required to be met for IPLAT to provide approval.

Statements with “should” will be used for instructions that are incorporated into the label unless adequate justification is provided to IPLAT to warrant exempting the label instruction.

The term “label” used throughout these instructions refers to any one of the following:

Silk-screened labels: Markings that are silk-screened, with ink, onto hardware.

Decals: Peel-off labels with adhesive backing that are applied onto hardware.

Ink-stamped labels: Markings, stamped with ink, onto the hardware.

Engraved or etched labels: Markings carved onto the hardware surface.

Placards: Cards that are inserted into pockets.

Any other method of applying markings onto hardware.

SSP 50005, International Space Station Flight Crew Integration Standard (NASA–STD–3000/T) was used as the basis for the payload labeling guidelines contained herein.

C.2 ISS PAYLOAD LABEL APPROVAL PROCESS

The PD is responsible for providing drawings with label location and content, and information sufficient to enable IPLAT to determine that the instructions herein are met. The PD shall deliver drawings to the Payload Data Library (PDL), or other database accessible by IPLAT.

IPLAT is responsible for reviewing all payload labels, providing guidance to the PD and granting approval based on the instructions herein. IPLAT is also responsible for performing a human engineering assessment of the labels and ensuring the labels are appropriate from a human engineering perspective, including commonality, and standardization. IPLAT reviews both U.S. and International Partner (IP) payload labels.

IPLAT reviews labels against the approved Operations Nomenclature (OpNom). IPLAT does not approve OpNom, procedures, and displays. OpNom is the operationally relevant term used to describe hardware. For U.S. payloads, OpNom is approved by the USPODFCB. For IP payloads, the appropriate ODFCB (Operations Data File Control Board) approves their OpNom. Approved OpNom can be found in the OpNom document, SSP 50254, and in the MIDAS database.

The process for obtaining approval of ISS payload labels is shown in Figure C.1-1. IPLAT performs two label evaluations, an initial and a final label evaluation. The preliminary OpNom review should be conducted first, in preparation for the initial review. The preliminary OpNom review consists of evaluating pre-released drawings (or material sufficient to represent the hardware's labeling) and the preliminary OpNom to determine if the OpNom is operationally relevant and usable for the hardware. After the preliminary OpNom review, the initial label evaluation is performed. This supports an integrated process prior to drawings being released and completion of hardware development. Upon receiving the drawings, or other materials, IPLAT has 10 working days to complete the initial label evaluation. IPLAT will return a checklist that documents any requirement violations, and suggested solutions. Once the initial label evaluation has been completed, all changes that potentially affect OpNom shall be coordinated with all OpNom mandatory reviewers. The PD will update the label designs based on inputs regarding OpNom requirements from the OpNom mandatory reviewers and IPLAT's recommendations.

The final label evaluation can be completed in one of two ways: 1) via approval of released engineering drawings, or 2) review of digital images certified to be of the flight hardware with labels installed. With the first approach, labels should be ordered after IPLAT approval of the drawings via the JSC Form 732. With the second approach, labels shall be ordered and then installed before pictures can be

submitted to IPLAT for approval. This approach should be done in close coordination with IPLAT to ensure the correct labels get ordered and applied to the hardware in the correct locations. IPLAT has 10 working days to complete the final label evaluation. During the final label evaluation, IPLAT will perform a final check to ensure that the labels match the approved OpNom. Note: The part numbers of the flight hardware and their OpNom must be in MIDAS in order for the Hardware ID labels to be ordered. If the labels meet the requirements, IPLAT returns JSC Form 732, approved, to the PD. Form 732 is the PD's official verification that the labels meet the requirements, and should be included in the payload's verification record.

Labels shall be installed and IPLAT approval completed before the payload's bench review.

The PTR Board is responsible for resolving issues and disagreements between the PD and IPLAT.

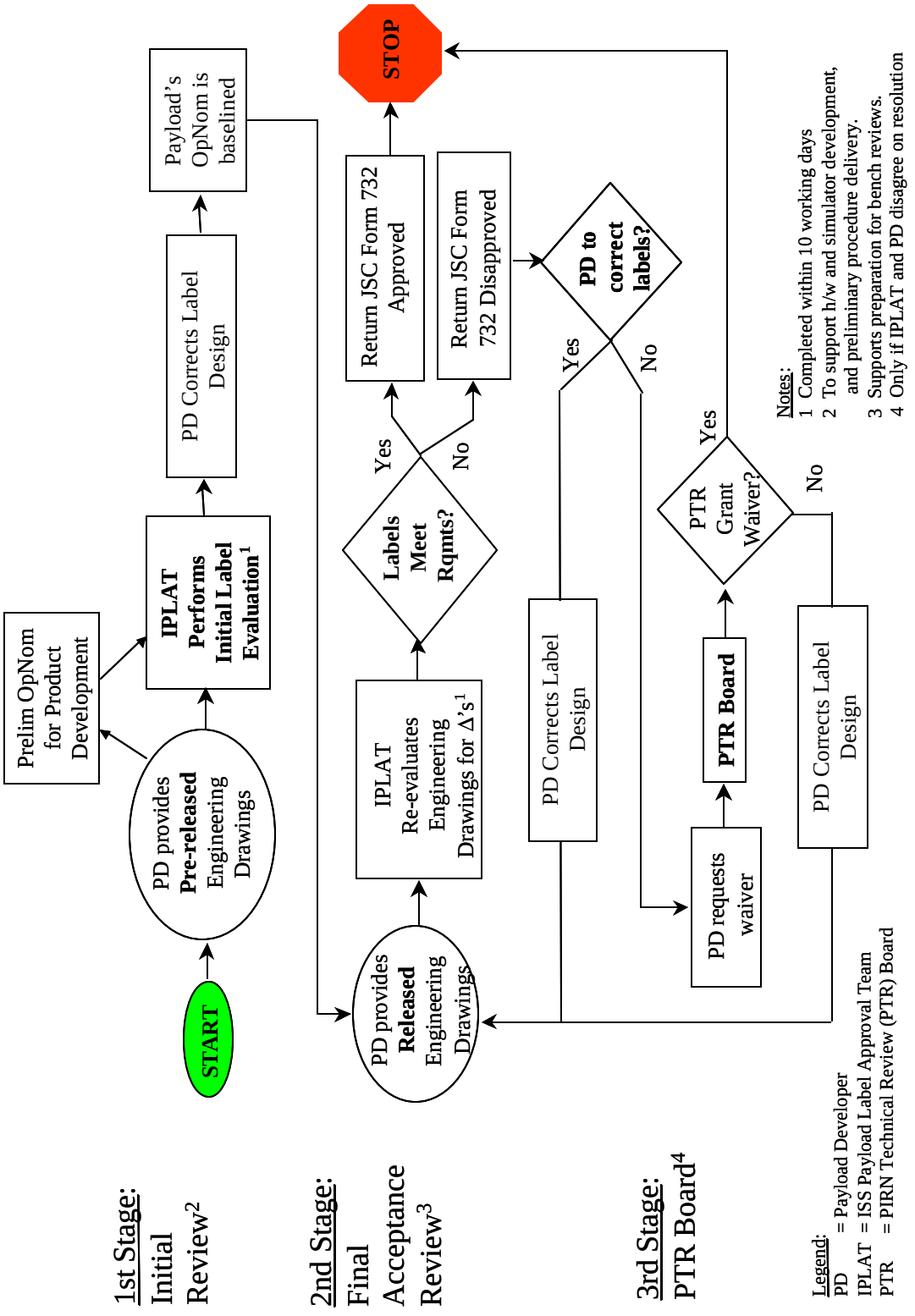


FIGURE C.1-1 IPLAT PAYLOAD LABEL APPROVAL PROCESS

C.3 IPLAT APPROVAL INSTRUCTIONS

IPLAT will use the following instructions in reviewing and providing the approval of payload labels.

The following definitions will be used throughout this section:

“Passive”, as it relates to payload hardware, is defined as hardware that cannot itself be powered, such as cables and hoses, consumables, etc.

“Active”, as it relates to payload hardware, is defined as hardware that can be powered and performs a specific payload function.

“Non-rack self-contained payloads” refers to a category of equipment that becomes powered, or active, but is not mounted on the front of a rack like a subrack payload.

“Loose Equipment” is defined as passive, unpowered equipment generally found in payload stowage (e.g. cables, consumables such as biocide wipes, science samples, tools, etc.)

C.3.1 GROUND ASSEMBLY AND HANDLING

Labels used for ground assembly and handling shall not interfere with on-orbit crew interface labeling. Product marking for ground assembly and handling should be in accordance with MIL–STD–130, section 4, except paragraph 4.1.c.

C.3.2 FUNCTION CONSIDERATIONS

A. Labels for crew interfaces shall contain information regarding the operational interface (e.g. the purpose, the function, and/or the functional result of the use of equipment items) and comply with the approved OpNom. Engineering characteristics or nomenclature may be described as a secondary consideration.

B. Instrument labels, for example, should be labeled in terms of what is being measured or controlled and use the approved OpNom. Calibration data may be included where applicable.

C.3.3 PAYLOAD ORIENTATION

A. Payload labeling, displays, and controls shall have a consistent rack vertical orientation arrangement with the rack vertical axis origin at the bottom of the rack hinge point.

B. Payload labels required for operations with the rack(s) rotated should be oriented with respect to required crew positions.

C.3.4 LABELING DESIGN

C.3.4.1 LABELING STANDARDIZATION

A. Standard decals needed by the PD are available in JSC 27260, Decal Process Document and Catalog. Decals shall either be obtained from the Decal Design & Production Facility (DDPF), or shall be designed to be identical to them. Examples of labels found in the catalog are: Hardware ID labels, IMS barcodes, fire hole, toxicology, hazardous, caution and warning, rack power switch, fire indicators, cable/hose labels, etc. The DDPF is also available to PDs for fabricating labels not found in JSC 27260.

B. Labeling shall be standardized between and within systems.

C. Payload labels shall conform to the ODFCB approved OpNom, SSP 50254 and applicable partner annexes.

D. Hardware ID label Text

Figure C.3.4.1.D-1 shows examples of payload hardware ID labels. The requirements for this label are as follows:

(1) Each label shall contain a horizontal line. A vertical line may be used for vertical space limitations.

(2) ONLY the OpNom for the item to which the label will be applied shall appear above the line or to the left of the line.

(3) The payload's acronym (if applicable) shall be spelled out on the main unit's hardware ID label. This should be placed directly below the line.

(4) The part number and serial number (if applicable) shall fall below the line, and below the spelled out payload name.

(5) If the Inventory Management System (IMS) barcode is integrated with the hardware ID label, it shall fall below the line, and be placed in the lower right hand corner of the label.

(6) On control panel name labels, the OpNom shall be above the line. The spelled out name, if needed, should be applied under the line.

(7) No other text, other than that mentioned above, shall appear on the hardware ID label.

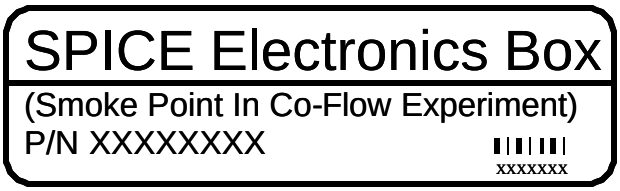
(8) Stowage Kit Contents Label: Each item listed under “Contents” shall equal the approved OpNom.

a) Rack “main unit” name example

b) Rack “main unit” name example - vertical space limited

c) Subrack “main unit” name example

d) Subrack “main unit” name example - vertical space limited



e) Example of “main unit” name for a “Non-rack self-contained payload”

f) Example of subordinate equipment name

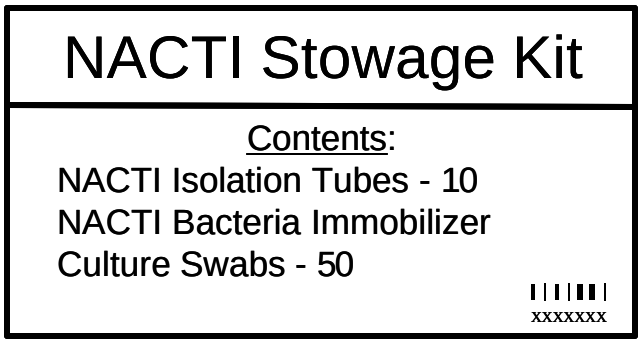
Note: These standard labels can be ordered from the Decal Design & Production Facility (DDPF) through the BITS (Barcode Inventory Tracking System) group. Reference drawing SDG32108325.

FIGURE C.3.4.1.D-1 HARDWARE ID LABELS (TO SCALE)

Note for OZ3 person updating SSP 57000 – do not change the size of this figure, it is "to scale". Changing it's size would make it not to scale.

g) Control Panel name example

h) Control Panel name example - vertical space limited



i) Stowage kit name/contents label

Note: These standard labels can be ordered from the Decal Design & Production Facility (DDPF) through the BITS (Barcode Inventory Tracking System) group. Reference drawing SDG32108325.

FIGURE C.3.4.1.D-1 HARDWARE ID LABELS (CONTINUED) (TO SCALE)

Note for OZ3 person updating SSP 57000 – do not change the size of this figure, it is "to scale". Changing it's size would make it not to scale.

E. Casing:

1) Controls labels on a control panel shall be in UPPER case only.(e.g. switches and their positions, connector ports, LEDs, etc.). This includes abbreviations and acronyms.

2) Hardware ID labels shall be per the casing of the approved OpNom.

3) Keypads – Non–COTS keypads on payloads should use title case letters.

F. Size

(1) Sizes of label text shall be per Table C.3.4.1.F-1:

TABLE C.3.4.1.F-1 CHARACTER HEIGHT – 710 MM (28 IN) VIEWING DISTANCE	
MARKINGS	**CHARACTER HEIGHT[1]**
Rack Name (examples "a" and b" of Figure C.3.4.1.D-1)	**0.48 in, or 12 mm (min) for OpNom** **0.24 in, or 6mm for spelled out name**
Subrack Name (examples "c" and d" of Figure C.3.4.1.D-1)	**0.28-0.36 in, or 7-9 mm for OpNom** **0.18 in, or 4mm for spelled out name**
Non-rack Self Contained Payloads (examples "e" and f" of Figure C.3.4.1.D-1)	**0.12-0.36 in, or 3-9 mm for OpNom** **0.10 in-0.18 in, or 2.5-4mm for spelled out name**
Loose Equipment, ORUs	**0.12 in or 3 mm (min)** **0.10 in or 2.5 mm for part/serial number**
Control Panel Names	**0.22-0.28 in, or 5-7 mm for OpNom** **0.12 in-0.18 in, or 3-4mm for spelled out name**
Stowage Kit Contents Label	**0.20-0.24 in, or 5-6 mm for kit OpNom** **0.12 in-0.14 in, or 3-4mm for individual contents' OpNom**
Controls (e.g., switches, connector ports, etc. on a control panel)	**0.10 in-0.20 in, or 2.5-5 mm**
For critical markings, with position variable (e.g., numerals on counters and settable or moving scales)	**0.20-0.31 in, or 5-8 mm**
For critical markings, with position fixed (e.g., numerals on fixed scales, controls, and switch markings, or emergency instructions.	**0.16-0.31 in, or 4-8 mm**
Notes: 1 See Figure C.3.4.1.D-1 for examples.	

(2) Size Categories – Characters used in hierarchical labeling (e.g. rack name, subrack name, controls groupings, port names, etc.) should be graduated in size per Table C.3.5.10.4-1. There should be at least a 25 percent difference in the character height between each of these categories.

(3) Size of Decals – The size of decals should be designed such that the "white space" between label text and the outer edges of the decal do not exceed 0.25 inches. This is to minimize the footprint of decals, which can cause visual clutter or physical interferences on-orbit.

C.3.4.2 READABILITY

A. Labels should be as concise and direct as possible.

B. Abbreviations shall comply with SSP 50254.

C. Language

(1) Labels shall be written in the English language.

(2) If dual languages are used, English shall be used first and with lettering at least 25% larger than the secondary language.

D. Labels should be designed so as to minimize visual clutter.

E. Displays and Controls Title Selection - Physical Hardware

(1) When verbs are used to label physical hardware (buttons, switches, controls, etc.), the present tense should be used. For example: OPEN or CLOSE, BEGIN, or END, START or STOP, etc.

(2) Physical Hardware Linked to Software Displays – If physical hardware is linked to and/or represented by software displayed data or controls (i.e. LCD), the labels for the physical hardware and the software representation shall match.

(3) Circuit Breakers

i) If the physical device in any way operates as a circuit breaker, the abbreviation "cb" shall be used in the label. For example: POWER cb.

ii) Circuit breaker positions shall be labeled OPEN and CLOSE, not ON and OFF or PUSH and PULL.

(4) Switches – Switches shall be named according to their function.

(5) Push Buttons – Push buttons shall be named according to their function. If necessary, use the word PRESS (not MASH, PUSH or DEPRESS) to instruct the crew how to operate it.

F. Units of measure shall be in Standard International (SI) units, unless otherwise required to match the hardware.

C.3.4.3 LABEL PLACEMENT

A. All labels shall be placed on the payload hardware in accordance to the label location drawings.

B. Payloads Operated from Rack Front Panels – Labels for Payloads operated from the front panel of racks shall be placed in accordance to Figure C.3.4.3-1.

(1) Rack hardware ID label – The rack hardware ID label shall be placed in the upper left corner of the rack. If the IMS barcode is attached separately, it shall be placed to the right of the hardware ID label.

(2) Subrack hardware ID label – The subrack hardware ID label shall be placed in the upper left corner of the subrack. If the IMS barcode is attached separately, it shall be placed to the right of the hardware ID label.

(3) The Rack UIP shall be labeled “Rack UIP”. This label shall be placed in the upper left corner of the Rack UIP.

C. Non-rack self-contained payloads, ORUs – The hardware ID label shall be placed in the upper left corner of the dominant face of the payload. If the IMS barcode is attached separately, it shall be placed to the right of the hardware ID label.

D. Loose Equipment

(1) The hardware ID label shall be placed in the upper left corner of the dominant face of the payload. If the IMS barcode is attached separately, it shall be placed to the right of the hardware ID label.

(2) Items that cannot accept a hardware ID label for form, fit, or functional reasons shall have a hardware ID label for the item on the outside of its container.

(3) For cases where an item only has room for the OpNom or a barcode, but not both, a label with the OpNom shall take precedence.

E. Control Panel Labels

(1) Control panels shall have a hardware ID label with the approved OpNom.

(2) Positions - Labels shall be centered above connectors, switches, LEDs, displays, controls, etc. Labels may be placed in other locations when they cannot dimensionally fit in the required location, or if they would be obstructed by items like cables and hoses, or to preclude inappropriate association with adjacent items.

(3) Size – Label text for controls on a panel should be smaller than the name label for the panel, and should be between 0.10 in and 0.20 in per Table C.3.4.1.F-1. Labeling for different levels of controls should be graduated in size. For example, grouping label titles should be larger than the labels for the controls within them. Similar levels of controls should be the same size. See Figure C.3.4.3-2 for examples.

F. Part Numbers and Serial Numbers

(1) Part Numbers and Serial Numbers should be placed together for ease of identification. If they are included in the hardware ID label, they shall be placed below the line.

(2) If the Part Number and/or Serial Number are not included in the hardware ID label, and a separate Part Number/Serial Number label are necessary, the Part Number should be arranged to the left or above the Serial Number.

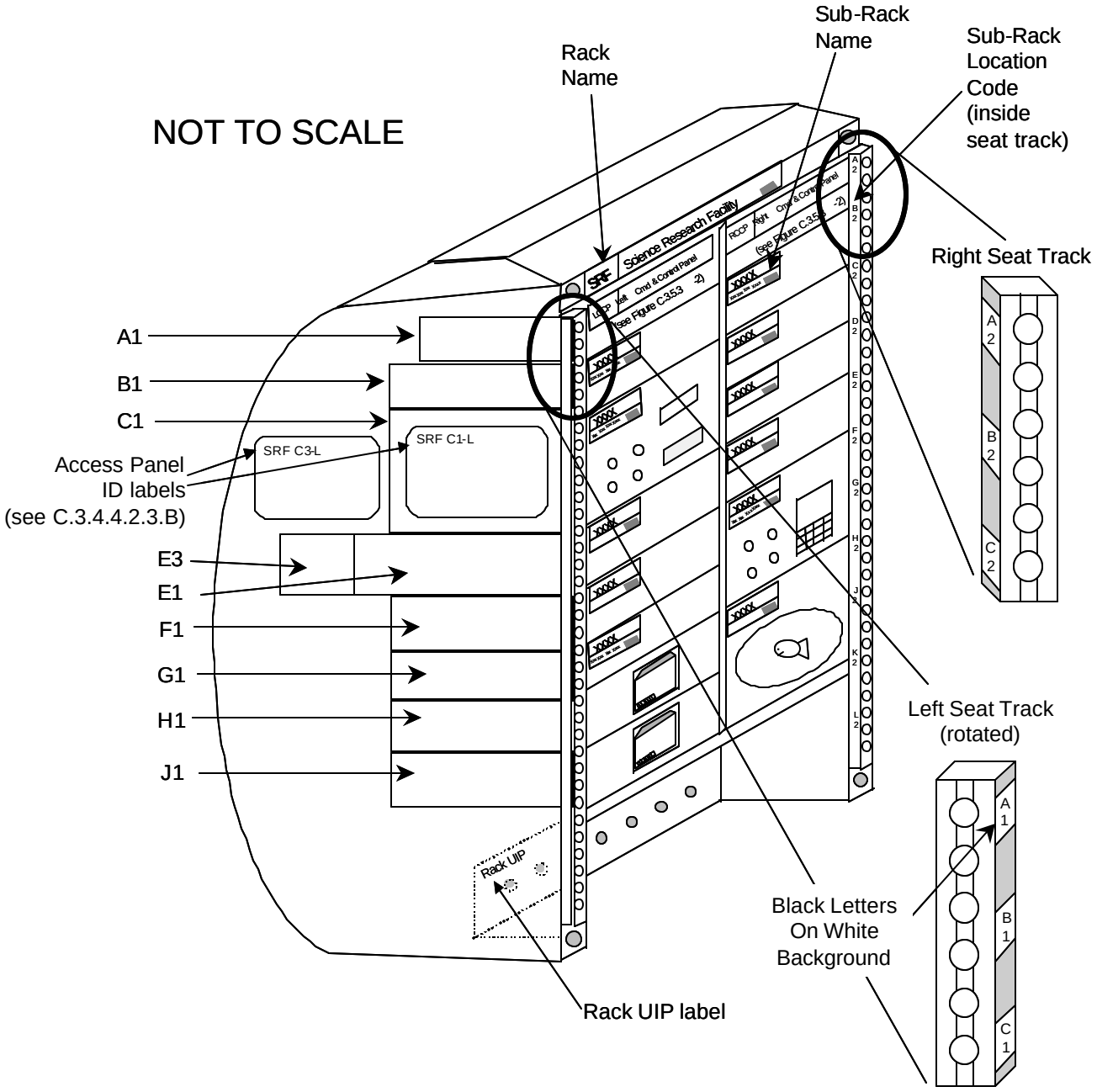
(3) "P/N" and "S/N", which are the standard OpNom representations for Part Number and Serial Number, respectively, shall be used.

G. Orientation – All markings and labels shall be oriented with respect to the local worksite plane so that they read from left to right. Vertical orientation, with letters arranged vertically if the text is short (e.g. DATA J3), or rotating the label 90 degrees when the text is long (e.g. PAYLOAD ELECTRONICS MODULE), is permissible when the marking or label does not fit in the required orientation.

H. Visibility –All labels shall be placed on equipment so that they are visible when the equipment is used or accessed. Markings should be located such that they are perpendicular to the operator's normal line of sight whenever feasible and should not be less than 45 degrees from the line of sight.

I. Overhead Panels – On overhead panels, markings and labeling shall be oriented such that they appear upright when observed from local vertical.

J. Association Errors – The arrangement of markings on panels should protect against errors of association of one marking or set of markings with adjacent ones.



Rack Name Label - Located in the upper left corner of the rack. 0.48 in minimum. IMS barcode is included.

Subrack Name Label - Located in the upper left corner of the subrack. Between 0.28-0.36 in. IMS barcode is included.

Subrack Location Codes - Located on the inside of the seat track. Letters A thru N, excluding I (0.18 in). Letter/number pairs must be placed at intervals equal to the individual rack's smallest drawer unit (e.g. 4 PU (7 inches) for U.S. payloads, different for IP racks).

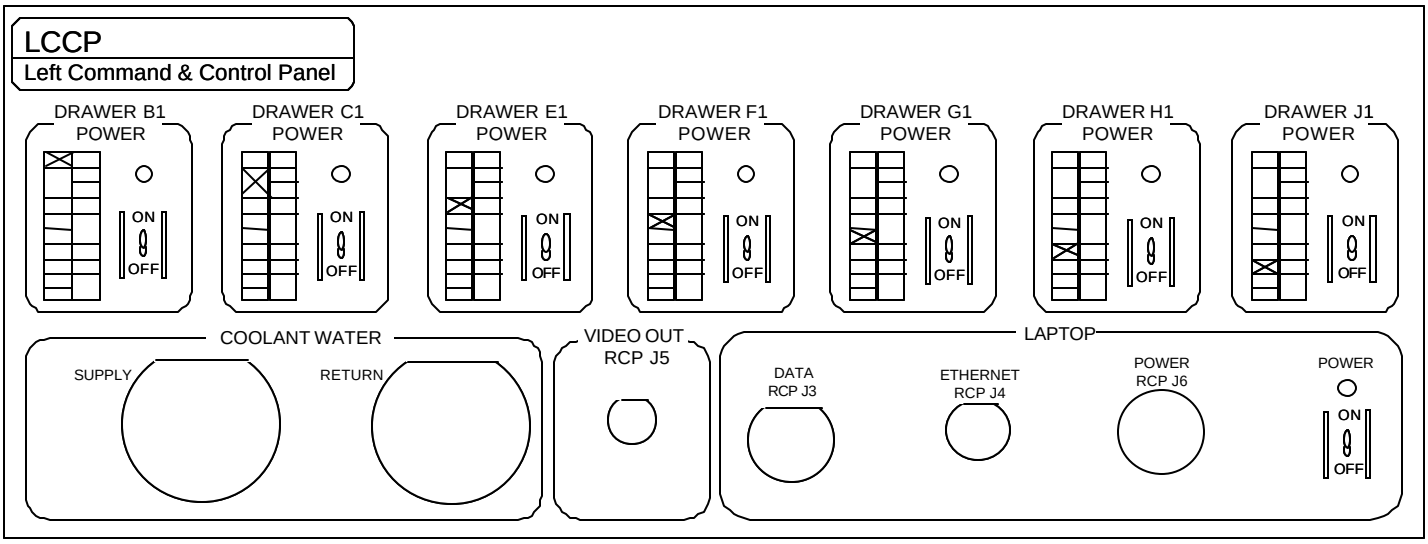
Rack UIP – This panel shall be labeled the "Rack UIP". The procedures are required to refer to the panel as "Rack UIP" also. Electrical and fluid/gas connector ports must be labeled.

Access Panels must be labeled.

FIGURE C.3.4.3-1 RACK LABEL PLACEMENT

NOT TO SCALE

This panel is at the “A1” position in Figure C.3.4.3-1:



This panel is at the “A2” position in Figure C.3.4.3-1:

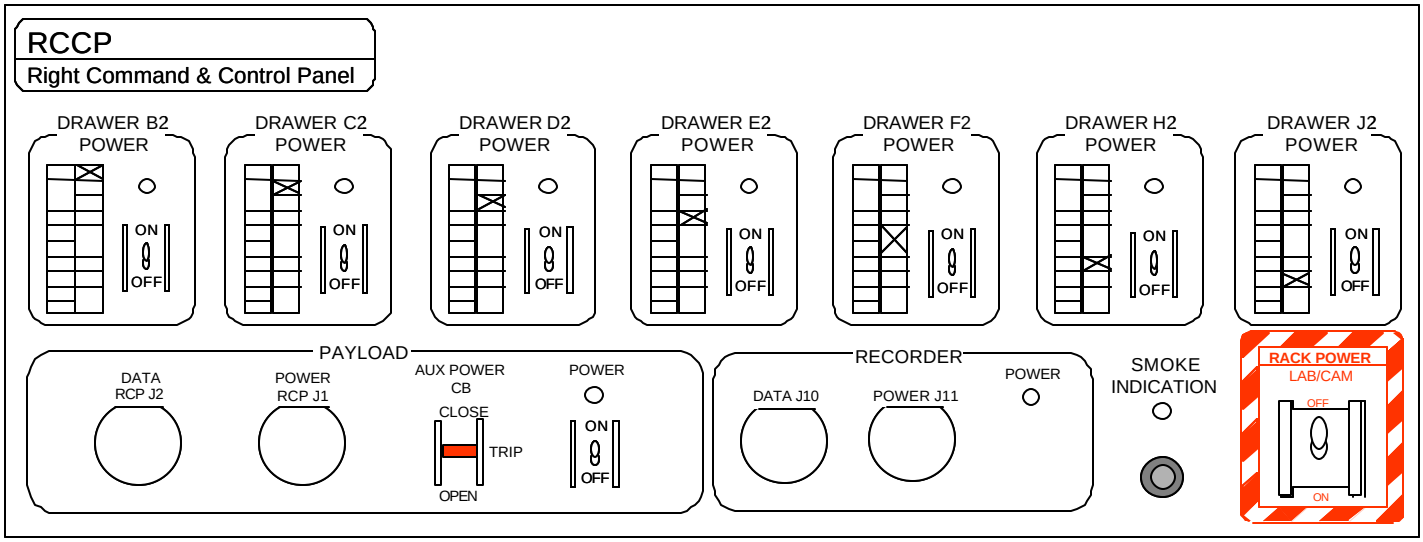


FIGURE C.3.4.3-2 CONTROL PANEL LABELING

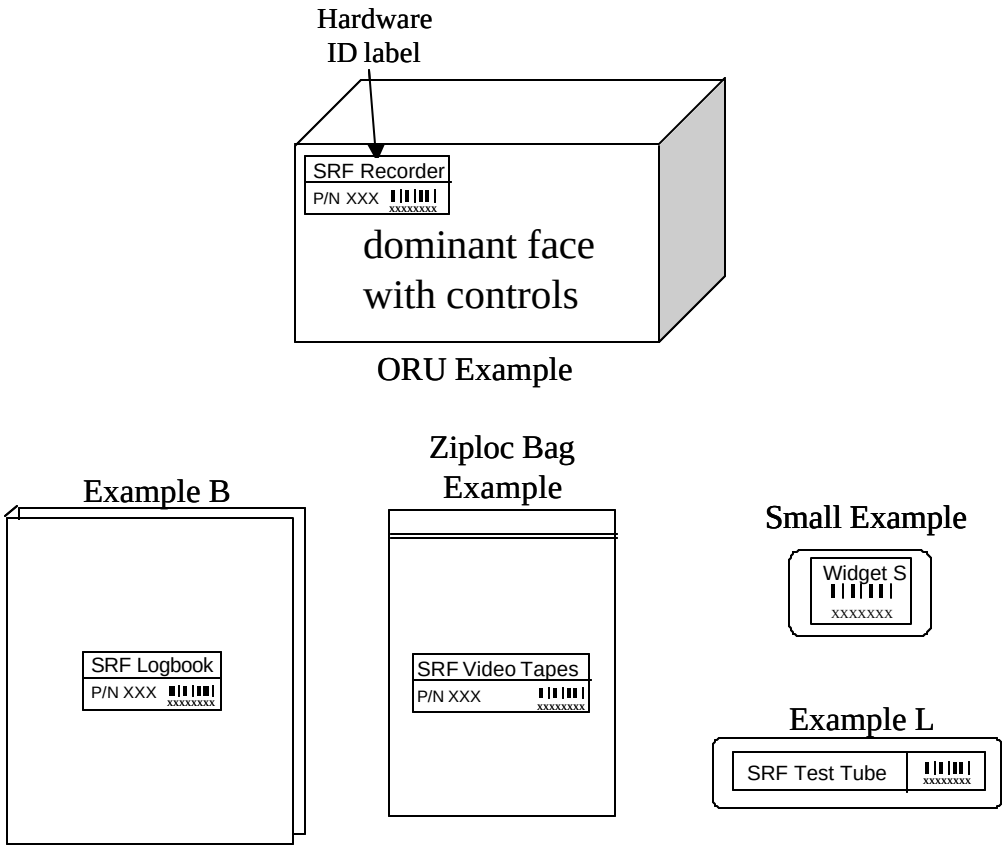


FIGURE C.3.4.3-3 MISCELLANEOUS LABEL PLACEMENT GUIDELINES

C.3.4.4 EQUIPMENT LABELING

C.3.4.4.1 EQUIPMENT IDENTIFICATION

A. All items on a piece of hardware that have a crew interface shall be identified, including, but not limited to: displays, controls, switches, connectors, LEDs, containers, vents, etc., such that these items can be clearly referenced in crew procedures. Use of acronyms and abbreviations shall be accordance with SSP 50254, OpNom document. The size for these labels shall be smaller than the main label naming the payload.

B. Containers shall be labeled to identify their contents using approved OpNom. (See Section C.3.5.6)

C. Deleted

D. Multi–quantity items

(1) Multi–quantity items that are permanently installed into hardware (not loose) that require individual distinction but are not serialized shall be individually numbered. Controls level items should be logically numbered/lettered left to right or top to bottom in descending order (e.g. “DRIVE A”, “DRIVE B”, “DRIVE C”).

(2) Serial Numbers – Multi–quantity items that are serialized should display the serial number as part of the identification.

(3) Move to C.3.5.6 (f)

E. Logos – If organizational or commercial logo(s) are used, they shall not be distracting to the crew while operating the payload. For front panels, the size of a logo should be smaller than the main name label.

C.3.4.4.2 EQUIPMENT CODING

C.3.4.4.2.1 CABLE AND HOSE LABELING

A. Crew Interface Cables and Hoses Definition – Electrical cables and hoses *which are interfaced with by the crew* for nominal operations (e.g. experiment operations), planned maintenance (e.g. ORU replacement), or are designed to have a crew interface in the event of a contingency situation, are considered “Crew Interface Cables and Hoses”, and are subject to the format requirements below.

B. Crew Interface Cables and Hoses shall have hardware ID labels, cable end labels, and any safety labels as deemed necessary. If one end of a cable or hose is permanently attached to a piece of hardware, that end does not require a cable end label, and it does not require an IMS barcode. The loose end that the crew interfaces with shall have a cable end label to tell the crew where it mates. If the cable must be distinguished from other permanently attached cables on the same device, the cables shall be labeled with the approved OpNom. If the cable or hose diameter is such that it can accept a sleeve/band style label, that is preferred. Flag style labels can be used if necessary. IPLAT can help the PD choose the appropriate style and size of the labels.

(1) Electrical Cable End Plugs and Corresponding Electrical Connector Ports

a) The cable end plug shall be designated with a “P” (e.g. P1), regardless of gender. Note: “P” should be used even for cable to cable connections.

b) Connector Port Names: The connector port name shall begin with a descriptor that describes its purpose (e.g. DATA or POWER), following by a "J" (regardless of gender) and a 3 or less character number. Examples: DATA J510, POWER J1.

c) The plug number and receptacle number for a mating pair should be identical (e.g. P1 mates with J1), except when not possible because a cable is generic.

(2) Cable and Hose Label General Characteristics
The OpNom of the cable/hose.

a) Size - The size of the text on these labels should be 0.12 in preferred, or 0.10 in minimum.

b) Text/Background Color - The text should be black on a white background, or black on silver background (for metalphoto).

c) Abbreviations shall comply with SSP 50254.

(3) Cable and Hose Identifying Labels - Cables and hoses shall contain a main identifying label with the information below. This label shall be placed at the mid-length position of the cable/hose, *unless the cable or hose is 6 meters or greater, which would then require an identification label placed every 2 meters.* See Figure C.3.4.4.2.1-1 for examples.

- The OpNom of the cable/hose.
- For hoses: The flow direction should be indicated with an arrow below the OpNom if the hose ends are not interchangeable.
- The Part Number of the cable or hose (optional)
- The Serial Number of the cable or hose (optional)

(4) Cable and Hose IMS Barcodes – A cable/hose shall have an IMS barcode. It shall be placed to the right of the hardware ID label (if not using a standard hardware ID label with the IMS barcode included), at the mid-length position, as shown in Figure C.3.4.4.2.1-1.

(5) Cable and Hose End Labels - Labels at the terminal ends of cables/hoses shall contain the information below in vertical order, center justified. See Figure C.3.4.4.2.1–1 for cable/hose label examples.

First Line: The name of this end of the cable/hose. For cables this is the "P", or plug, number. For a hose, if the end does not have a specific identifier, this line may be left off. If the hose end needs to have a unique identifier, do not use a "P" number ("P"s are reserved for cables).

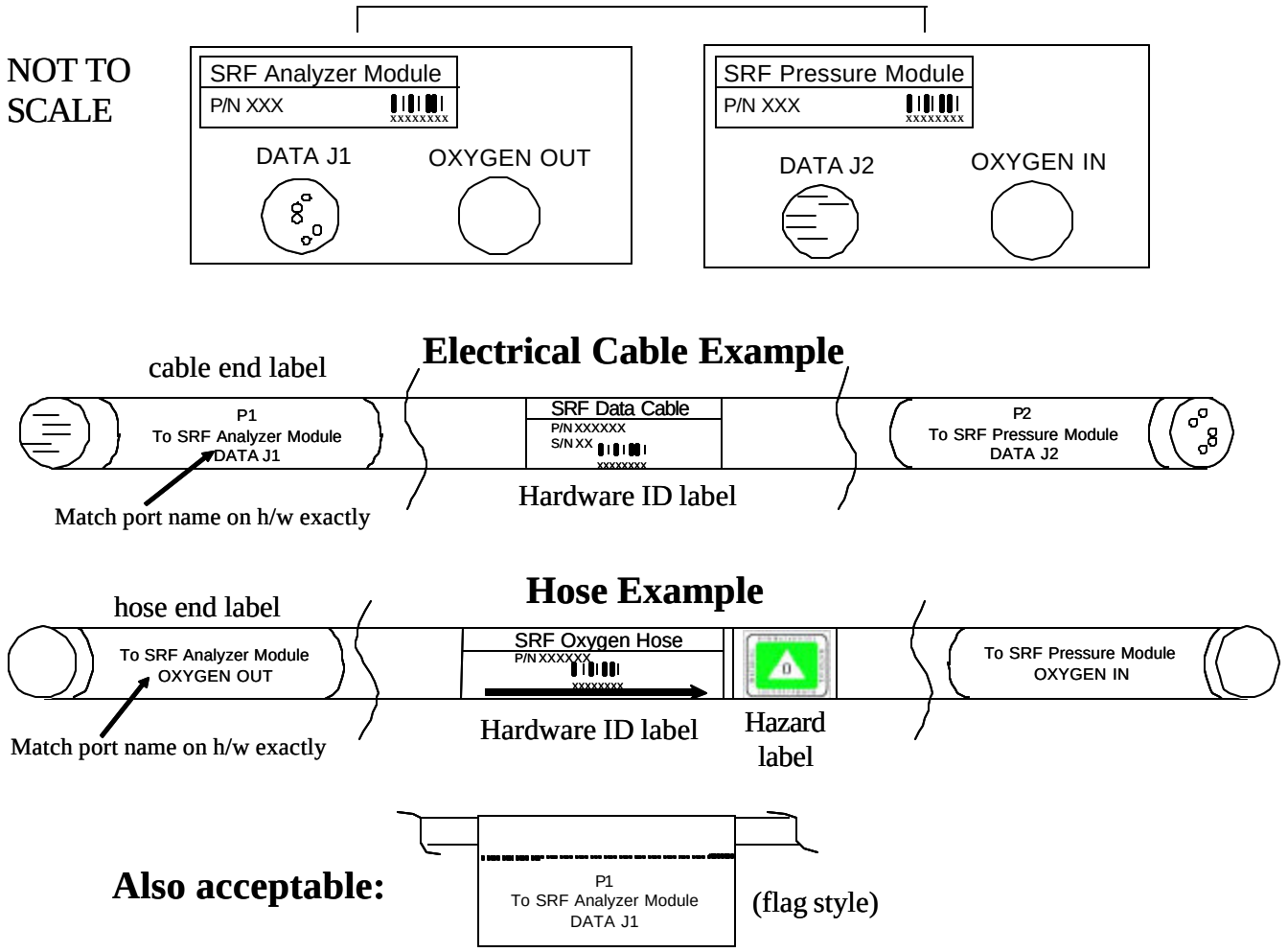
Second Line: The word "To" followed by the OpNom of the piece of equipment to which this end of the cable/hose mates with. The text casing shall match the OpNom. If this end can interface to multiple connector ports (e.g. generic cables), this line may be left off.

Note: "Mates with" terminology ("M/W"), for cables already designed based on Boeing-provided ISS cables, is acceptable as long as the connection information is obvious. New cables must use the standard "To" terminology.

Third Line: The exact name of the receptacle on the hardware that this end of the cable/hose mates with (e.g. DATA J1 or OXYGEN OUT). The text case shall match the casing on the panel. If this end can interface to multiple connector ports (i.e. generic cables), this line may be left off. If the receptacle is on a piece of hardware not provided by the PD (e.g. GFE laptop), and the receptacle is not properly labeled, appropriate descriptive words shall be used (e.g. SERIAL PORT).

Note: If cables are clustered together and cannot display the 3 lines of information on cable end labels without causing physical interference and visual clutter, having the first line (the "P" number) will be allowed.

(6) Hose Hazard Labels – Hoses shall have standard hazard class decals indicating the appropriate hazard level for the substance transported through the hose. This label shall be placed to the right of the identifying label.



Notes:
Electrical cables/ports: "P" designates cable end plugs and "J" designates receptacles on hardware regardless of gender (pins/sockets).

Hose End Labels: The first line of the end label may be left off (as shown above) if the hose end does not have a specific identifier. In this case, only the second and third lines are needed. If hose ends must be identified, do not use a "P" number.

Hose Identifying Labels: Flow direction should be shown if the hose ends are not interchangeable.

FIGURE C.3.4.4.2.1-1 CABLE AND HOSE LABELING

C.3.4.4.2.2 COLOR CODING

Color coding should only be used to enhance the ability of the ISS crew to perform tasks.

A. Red, yellow, and orange shall only be used to mark emergency use, caution, and warning labels. See section C.3.4.8 for Caution & Warning labeling requirements.

B. Hazard Labels – Hazard labels have their own, unique coding scheme, of which color is one factor. See Section C.3.4.8.I for instructions.

C. Identification/Connectivity – Color coding used for component identification or to denote connectivity relationships shall combine color with text such that when those components are referred to within procedures, it is clear which components the procedures are referring to.

D. Color Difference

(1) The colors chosen shall be easily distinguished from one another within the same system or integrated rack.

(2) Each color shall always be associated with a single meaning within the same system or integrated rack.

E. Number of Colors – No more than 9 colors, including white and black, shall be used in a coding system.

F. Markings/Background Color – Markings and background colors on labels shall have sufficient contrast such that the labels are readable in ambient ISS lighting conditions. Labels should adhere to the accepted combinations of markings and background color listed below. Labels that do not fall into these marking/background categories will be approved on a case-by-case basis. The key concern is contrast.

Marking	Background
Black	White
Black	Yellow
Black	Silver (metalphoto labels)
White	Black
White	Red
White	Grey
Yellow	Blue
Red	White
Blue	Yellow

C.3.4.4.2.3 LOCATION AND ORIENTATION CODING

A. Subrack Location Codes:

(1) At the Rack Level - Subrack location codes shall be placed along the inside surface of the seat track at intervals equal to the individual rack's smallest drawer unit (e.g: 4 PU (7 inches) for U.S. payloads, different for IP racks), as shown in Figure C.3.4.3-1. Each letter/number pair shall be 0.18 in and placed at the top of the particular drawer interval. Locations other than the inside of the seat track are permissible only if there is a permanent obstruction that would cover the labels.

(2) For Control Panels That Control Multiple Subracks – Each subrack's controls shall be mapped to its location using the letter/number code (e.g. "A1", "A2", "B1", "B2", etc.), and a graphic (matrix with appropriate box checked) showing the individual locker's location in the rack. See Figure C.3.4.3-2 for examples.

B. Access Panels - Maintenance access panels shall be labeled to assist the crew in locating the panel for maintenance activities.

(1) Access panel identification labels should be located in the upper left corner position on the panel with respect to the local vertical orientation.

(2) Access panel identification labels for access panels on the side or back of a rack shall be labeled as in Figure C.3.4.3-1 and include:

- The OpNom for the rack (e.g. "SRF").
- Its height location using the subrack location code becomes part of the OpNom (e.g. "C3") .
- Its left, right, or back location on the rack preceded by a hyphen (e.g. "-L" for left, "-R" for right, "-B" for back).becomes part of the OpNom for any part the crew sees

  For example, a completed access panel label might be "SRF C3-L" or "SRF C3-R".

C. Alignment Marks/Interface Identification

(1) Alignment Marks – Alignment marks or other orientation markings shall be used to aid the crew with the installation/mating of equipment when the hardware requires a specific orientation.

(2) Visibility – Alignment marks, arrows, or other labels showing required orientation shall be visible during alignment and attachment.

(3) Tethered Equipment – Interface identification should not be used for movable items tethered to a mating part (e.g., dust cap for an electrical connector, hinged lid for a stowage container).

C.3.4.5 OPERATING INSTRUCTION LABELS

Operating instruction labels are labels (affixed to hardware) that contain procedural steps. The procedural text should conform to ODF standards as documented in ODF Standards, SSP 50253 and be approved by the appropriate IP ODF component board. For US payloads, submit ECR to USPODFCB for review and approval.

C.3.4.6 STOWAGE CONTAINER LABELING

This section applies to stowage containers or kits provided by the payload, located within the payload, not in general ISS stowage containers. A standard stowage OpNom/contents label (see example g in Figure C.3.4.1.D-1) exists that can be ordered for the purpose of meeting the below requirements.

A. Each stowage container (and its sub-containers) shall display the contents on its front surface visible to the crewmember. All contents shall be identified using the approved OpNom. If the available marking space on a container is insufficient to display the complete content titles, a contents list shall be displayed elsewhere and clearly identified as belonging to the sub-container.

B. Provisions should be made to permit in-flight revisions to or replacement of stowage labels on all stowage containers.

C. Individual Crew Items – Items allocated to a specific crewmember should be identified on the contents list with the user's title, name, or other coding technique.

D. Tool/Accessory Kit Labeling – Containers with designated locations for placement of equipment set (e.g., socket wrenches in a tool kit) should have each location identified with the OpNom of the item stowed.

E. Containers containing multiple quantities of the same item should use a dash followed by a number, after the name, to indicate the quantity (i.e. "TEST TUBES - 4", indicates there are four test tubes in the container).

C.3.4.7 GROUPED EQUIPMENT ITEMS

A. Functional groups of three or more equipment items (i.e. displays, controls, switch positions, connectors, LEDS, etc.) shall be identified as a group (e.g., by common color, by boundary lines). Functional groups of equipment items are all associated or connected with a common system or

purpose. (e.g., CABIN AIR, FURNACE A, EXPERIMENT “M”, PANEL LIGHTING). Two functionally related items should be grouped when such grouping provides clarification of purpose and/or distinguishes them from surrounding items. See Figure C.3.4.7–1 for grouping label examples.

B. Labels shall be located above the functional groups they identify.

C. When a line is used to enclose a functional group and define its boundaries, the labels shall be centered at the top of the group, in a break in the line. When it is not possible to center the text at the top, the text may be placed elsewhere along the perimeter of the boundary line, but local vertical orientation or the text shall be maintained.

(1) The width of the line shall not be greater than the stroke width of the letters.

(2) The line shall form an enclosed rectangle, or box, with rounded corners. Deviations from the rectangular shape are allowed when dimensional restrictions preclude a perfect rectangle.

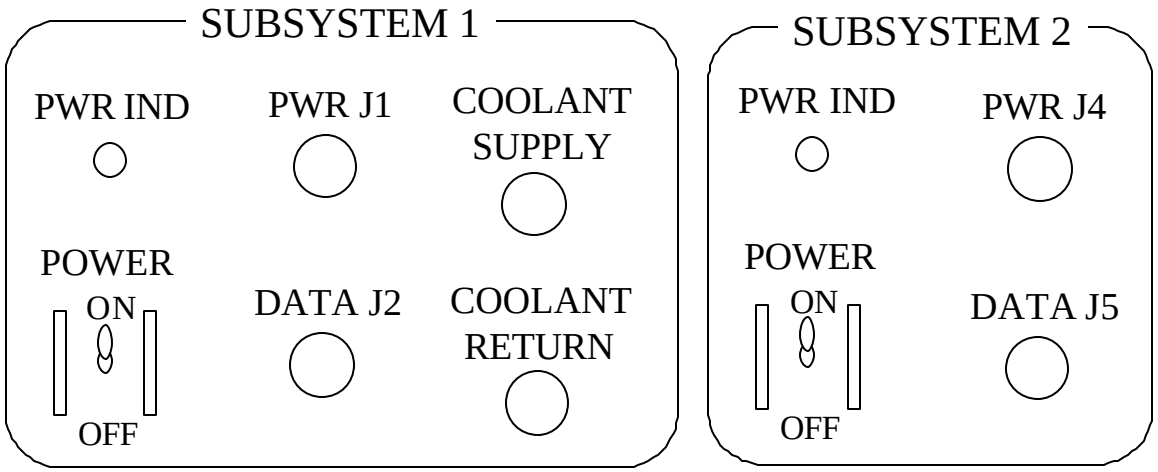


FIGURE C.3.4.7–1 GROUPING LABEL EXAMPLES

C.3.4.8 CAUTION AND WARNING LABELS

Caution and warning labels are required for indicating potentially undesirable conditions. See Figure C.3.4.8-1 for examples. The PSRP or an OZ3 safety representative shall approve non-standard Caution and Warning label wording.

A. Caution and warning labels shall be standardized between and within systems.

B. Caution and warning labels shall be distinct from one another.

C. Caution and warning labels shall identify the type of hazard and the action that would prevent its occurrence.

D. The caution and warning markings shall be located in a visible area.

E. Emergency-Use Label Specifications

(1) Labels on emergency-use items (e.g., repair kits, emergency lighting, fire extinguisher, etc.) shall be surrounded by diagonal red and white stripes either on the item or adjacent to it, and on its container.

(2) The emergency type warning stripes shall be alternate red and white.

(3) The red and white stripes should be of equal width.

(4) There shall be no fewer than four red stripes and three white stripes.

(5) The striping shall be applied at a 45 degree angle rotated clockwise from the vertical.

(6) The striping shall begin and end with a red stripe.

(7) The text shall be white letters on the red background or red letters on a white background.

F. Caution And Warning Label Specifications

(1) Labels on Caution and Warning items shall be either on the item or adjacent to it, and on its container. Caution/warning labels shall be surrounded by diagonal yellow and black stripes.

(2) The caution/warning type stripes shall be alternate yellow and black.

(3) The yellow and black stripes should be of equal width.

(4) There shall be no fewer than four yellow stripes and three black stripes.

(5) The striping shall be applied at a 45 degree angle rotated clockwise from the vertical.

(6) The striping shall begin and end with a yellow stripe.

(7) The text shall be black letters on the yellow background.

(8) For Caution and Warning items located within a storage container, the Caution and Warning label shall be applied to the outside of the container, and the titles of the Caution and Warning items shall be included on the marking.

G. Switches and Buttons

(1) The striping around a switch or button should not be wider than 25mm (1 in.) or narrower than 3 mm (0.125 in.).

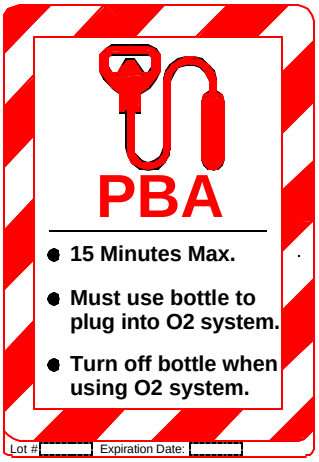
(2) If one side of a switch or button has less than 3 mm (0.125 in.) space, no striping should be applied to that side.

H. Hazard Labels

(1) Chemicals – The standard hazard class decals shall be used to identify the proper hazard class of payload chemicals (i.e. chemicals in solid, liquid, or gaseous states), as deemed by the payload's toxicology representative. The developer may obtain these decals from JSC 27260,

Decal Process Document and Catalog, or shall produce identical labels. See NSTS 07700, Volume 14, Appendix 9, Section 5.6.3 for hazard class definitions.

(2) Other hazards - When biological, radiation, sharps, battery, or other hazards are identified by safety personnel, the appropriate standard label (if available) shall be applied in a prominent location. The developer may obtain these decals from JSC 27260, Decal Process Document and Catalog, or shall produce identical labels.



Emergency Use Label Example

Caution/Warning Label Example

Toxic Hazard Label Examples

FIGURE C.3.4.8-1 CAUTION AND WARNING LABEL EXAMPLES

C.3.4.9 ALPHANUMERIC

C.3.4.9.1 FONT STYLE

A. The font style used on decals, placards, engravings, and labels shall be Helvetica or Arial. If these are not available, a similar sans serif font is acceptable.

B. Stenciled Characters – Stencil–type characters should not be used on display/control panels or other equipment.

C.3.4.9.2 PUNCTUATION

Punctuation should not be used on labels except as a part of the approved OpNom or as otherwise noted in this appendix.

C.3.4.9.3 SPECIAL CHARACTER

A. Subscript and Superscript Size – Subscripts and superscripts should be 0.6 to 0.7 times the height of associated characters.

B. Subscripts – Numeric subscripts and upper case letter subscripts should be centered on the baseline of associated characters.

C. Lower Case Letter Subscripts –The base of lower case letters and the ovals of g, p, q, etc., should be at the same level as the base of adjacent capital letters.

D. Degree Symbol – The degree symbol should be centered on an imaginary line extended from the top of the F or C symbols.

E. Pound or Number Symbol (#) – The pound or number symbol should be centered on an imaginary line extended from the top of the associated numerals and placed two stroke widths away from them.

C.3.4.9.4 LINE SPACING

A. The spacing between lines of related text should be 0.5 of upper case letter height.

B. Spacing between headings and text should be 0.6 to 1.0 of upper case letter height.

C.3.4.10 IMS BARCODES

PDs will coordinate with NASA/JSC organization OC for Inventory Management System (IMS) barcodes.

All equipment shall have an IMS barcode in accordance with SSP 50007. IMS barcodes placeholders shall be present on engineering drawings, if the standard hardware ID label (with IMS barcode included) is not used. If the PD orders their IMS barcodes from the DDPF, the Decal Catalog decal part number should be included in a note on the engineering drawing.

C.3.5 SCALE MARKING

A. Accuracy

(1) The precision of scale marking should be equal to or less than the precision of the input signal.

(2) In general, scales that are to be read quantitatively to the nearest graduation mark should be designed so that interpolation between graduation marks is not necessary. Interpolation should be limited to one half the distance between minor graduation marks.

(3) Scales should have a zero reference.

(4) If precise measurements are needed, scale graduation marks should be marked clearly to allow for unambiguous measurements.

B. Interval Values

(1) The graduation intervals should progress by 1, 5, or 2 units of decimal multiples thereof.

(2) The number of graduation marks between numbered graduation marks should not exceed 9.

C. Scale Markings

(1) The minimum width of a major graduation should be 0.89 mm (0.035 in.), the minimum width of an intermediate graduation should be 0.76 mm (0.030 in.), and the minimum width of a minor graduation should be 0.64 mm (0.025 in.).

(2) Major, intermediate, and minor graduation marks shall be graduated in size.

(3) Deleted.

(4) Graduation marks should be spaced a minimum of 1.5 mm (0.06 in.) between centerlines.